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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,014	10/31/2003	Yuuji Suzuki	103203-00008	7156

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EXAMINER

LAM, CATHY FONG FONG

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

V18

Office Action Summary	Application No. 10/698,014	Applicant(s) SUZUKI ET AL.	
	Examiner Cathy Lam	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
 4a) Of the above claim(s) 18-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 25-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>30 April 2004</u> . | 6) <input type="checkbox"/> Other: ____. |

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1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-17 and 25-29, drawn to an ultra-thin copper foil with carrier, classified in class 428, subclass 615.
- II. Claims 18-24, drawn to a method of producing an ultra-thin foil with carrier, classified in class 427, subclass 96+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by a different process such as by electrolytic coating. The process as claimed can be used to make a different product such as security mark.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Atty: George Oram on August 30, 2004 a provisional election was made with traverse to prosecute the invention of group I, claims 1-17 & 25-29. Affirmation of this election must be made by applicant in replying to this Office action. Claims 18-24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected

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invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

6. Claims 6, 7, 9, 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 6 (and 10), lines 4-8 is vague and indefinite, "a surface roughness of a surface of the carrier foil on the ultra-thin copper foil....., a surface roughness of a carrier foil side of the ultra-thin copper foil provided on the peeling layer" Is confusing, it seems that both surface roughness described here are referring to the same surface of the carrier foil. Furthermore, lines 8-14 are structurally indefinite. Clarification is required.

In claims 7 (and 9), lines 4-8 are vague and indefinite (see 112 rejection for claim 6). Furthermore, lines 9-13 are vague and indefinite, as it is unclear what "the surface roughness Rz.....plus 0.1 μ m to 0.2 μ m at the ultra-thin copper foil side from the projections of the surface relief....." is referring to? There is no antecedent basis for "the projections of the surface relief". Clarification is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-17 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (US 6346335) or Yamamoto et al (US 6660406) or Lin (US 5066366).

Applicant is claiming an ultra-thin copper foil with a carrier comprised of a carrier foil, a peeling layer, a strike plating layer, optionally a copper plating ultra-thin layer and an ultra thin copper foil; all in the named order.

Chen discloses a metallic composite comprised of a carrier layer (12), a release layer (16), a metal foil (14) and a bond strength enhancing agent (20); all in the named order (Fig. 1).

The release layer (16) which is formed between the carrier layer (12) and the metal foil (14), is a mixture of metal and a non-metal compound (col 4 L 16-17). The metal can be nickel, chromium, iron and non-metals can be oxides, phosphates, or chromate (col 4 L 21-34).

The metal foil (14) is preferably copper foil with under 10 μm , more preferably about 5 μm in thickness (col 4 L 7-11).

Yamamoto discloses a metallic foil composite comprised of a copper carrier, a nickel layer, a copper foil layer and a layer of copper microparticles; all in the named order.

The nickel layer is a nickel based alloy that contains at least one of phosphorus, chromium and copper (col 3 L 64-col 4 L 3). At least 10 wt% or more of phosphorus is

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preferred to be added to the nickel based layer (col 4 L 13-20).

Lin also discloses an ultra-thin foil composite comprised of a copper of copper alloy foil carrier and an ultra-thin layer of copper or copper alloy (col 2 L 21-25).

The carrier is first undergoing a cleaning treatment, after cleaning treatment, the carrier is treated with a chromic acid-phosphoric acid solution to apply a film (col 3 L 31-33). After the chromic acid-phosphoric acid treatment, the carrier is rinsed with water. After the foil is dried, an ultra-thin foil is deposited onto the copper carrier (col 4 L 34-37).

All the prior art teach an ultra thin copper foil composite; the composite is particularly used in printed circuit boards.

The prior art teach having a release layer which is comprised of chromium, nickel and phosphorus and their oxides. The prior art however do not teach a strike plating layer that comprised of phosphorus and copper.

In view of the prior art teachings, one skill in the art would include a phosphorus containing copper layer because phosphorus can increase resistivity of the ultra-thin copper foil (see Yamamoto, col 4 L 18-20). It would also be obvious that the release layer in the prior art may contain copper and phosphorus at the interface between the ultra-thin copper foil and the nickel-chromium-phosphorus release layer because diffusion occurs at the interface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cathy Lam
Primary Examiner
Art Unit 1775

cfl
September 2, 2004